Space Weather Highlights
21 May - 27 May 2018

SWPC PRF 2230
28 May 2018

Solar activity reached low levels during the period due to an isolated C-class event, a C2 flare from Region 2712 (N13, L=172, class/area Csp/80 on 24 May). No Earth-directed CMEs were observed.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached moderate levels on 21-27 May.

Geomagnetic field activity was quiet to unsettled on 23 May due to influence from a positive polarity, coronal hole high-speed stream (CH HSS). Quiet conditions were observed throughout the remainder of the period.

Space Weather Outlook
28 May - 23 June 2018

Solar activity is expected to be very low throughout the period, with a slight chance for isolated C-class events on 28 May - 04 Jun and 10-23 Jun, due to flare potential from Regions 2711 (N06, L=288, class/area Cai/60 on 24 May) and 2712.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach very high levels on 05-07 Jun with high levels expected on 02-04 Jun and 08-13 Jun. Moderate flux levels are expected for the remainder of the period.

Geomagnetic field activity is expected to reach G1 (Minor) geomagnetic storm levels on 02 Jun with active levels on 01, and 03-04 Jun due to the influence of a recurrent, negative polarity CH HSS. Unsettled levels are expected on 28-29 May and 05-06, 13, 19 Jun. Quiet conditions are expected during the remainder of the outlook period.

Daily Solar Data

Date	Radio Flux 10.7cm	Sun spot No.	Sunspot Area (10^{-6} hemi.)	X-ray Background Flux		Flares						
						X-ray			Optical			
						C	M	X	S	1	2	3	4
21 May	70	12	20	A1.0	0	0	0	1	0	0	0	0
22 May	71	12	20	A2.4	0	0	0	0	0	0	0	0
23 May	73	30	50	A5.1	1	0	0	0	0	0	0	0
24 May	74	39	140	A4.4	0	0	0	3	0	0	0	0
25 May	76	32	80	A5.3	0	0	0	3	0	0	0	0
26 May	73	26	70	A4.5	0	0	0	0	0	0	0	0
27 May	75	27	50	A4.1	0	0	0	1	0	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm^2 -day -sr)			Electron Fluence (electrons/cm^2 -day -sr)		
	>1 MeV	>10 MeV	>100 MeV	>0.6 MeV	>2MeV	>4 MeV
21 May	4.0e+05	1.7e+04	3.7e+03	3.9e+07		
22 May	1.9e+06	1.7e+04	3.4e+03	3.0e+07		
23 May	8.2e+05	1.7e+04	3.3e+03	5.4e+06		
24 May	4.3e+05	1.7e+04	3.4e+03	4.2e+06		
25 May	4.5e+05	1.8e+04	3.6e+03	8.2e+06		
26 May	6.9e+05	1.8e+04	3.9e+03	1.2e+07		
27 May	5.7e+05	1.8e+04	3.6e+03	1.3e+07		

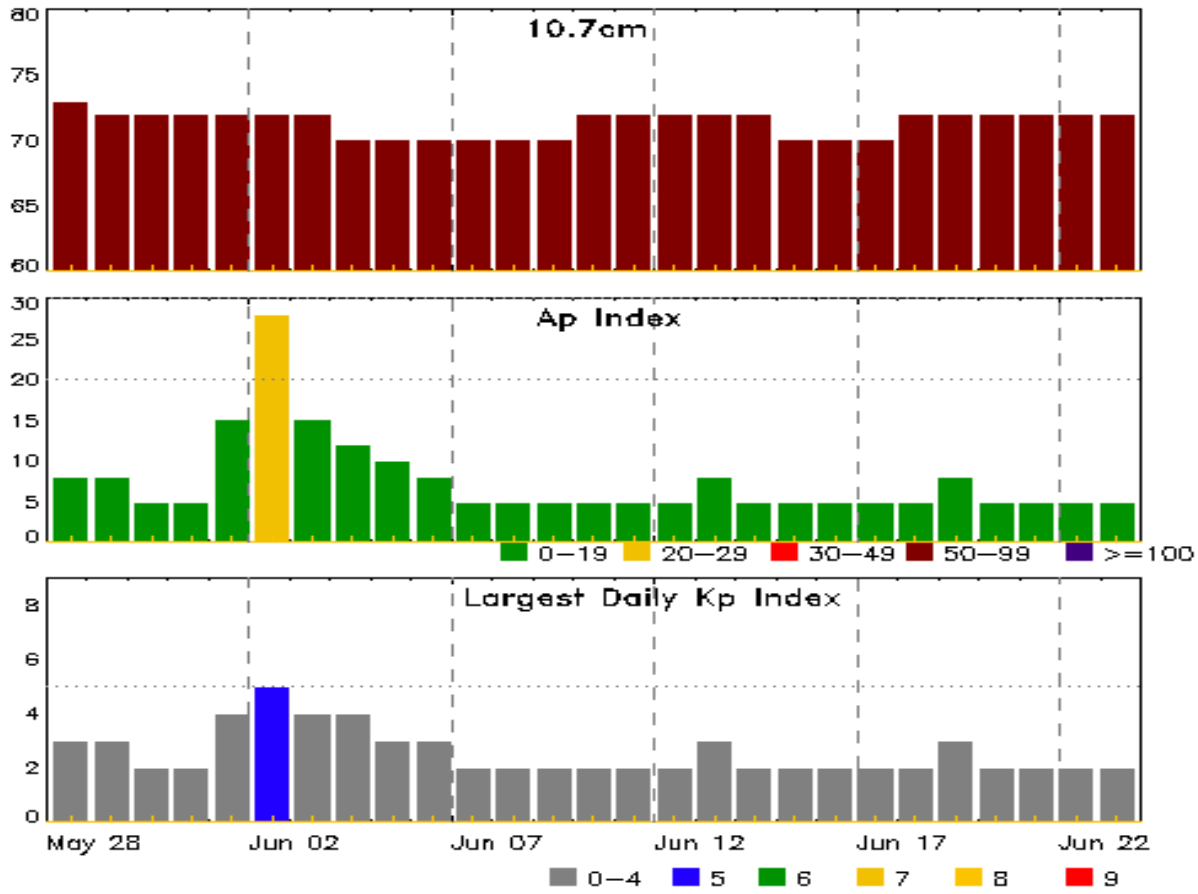
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
21 May	3	0-1-0-2-1-1-1-1	1	0-1-0-2-0-0-0-0	3	0-1-1-1-0-1-0-1
22 May	6	0-1-3-1-1-2-2-2	6	0-1-4-1-1-1-2-1	5	1-1-2-1-1-1-2-2
23 May	10	2-3-3-2-3-2-2-2	18	2-3-4-5-4-3-0-1	9	2-2-3-3-3-2-1-2
24 May	5	2-2-1-1-2-2-1-1	1	1-1-0-1-0-0-0-0	4	2-2-1-1-1-1-1-1
25 May	4	1-0-0-1-2-1-3-0	2	2-1-1-1-1-0-0-0	3	2-1-0-1-1-0-1-0
26 May	5	0-1-1-1-3-1-2-2	2	0-1-0-0-1-0-1-1	4	0-1-1-1-2-1-1-2
27 May	5	2-2-1-2-2-1-1-1	5	2-2-0-3-2-0-1-1	6	2-2-1-1-1-1-1-1

Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
23 May 0740	WARNING: Geomagnetic K = 4	23/0740 - 1100

Twenty-seven Day Outlook



Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index
28 May	73	8	3	11 Jun	72	5	2
29	72	8	3	12	72	5	2
30	72	5	2	13	72	8	3
31	72	5	2	14	72	5	2
01 Jun	72	15	4	15	70	5	2
02	72	28	5	16	70	5	2
03	72	15	4	17	70	5	2
04	70	12	4	18	72	5	2
05	70	10	3	19	72	8	3
06	70	8	3	20	72	5	2
07	70	5	2	21	72	5	2
08	70	5	2	22	72	5	2
09	70	5	2	23	72	5	2
10	72	5	2				

Energetic Events

	Time			X-ray		Optical Information			Peak Radio Flux		Sweep Freq Intensity	
Date	Begin	Max	Half Max	Class	Integ Flux	Imp/ Brtns	Location Lat CMD	Rgn #	245	2695	II	IV

No Events Observed

Flare List

	Time				Optical		
Date	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
21 May	0832	0837	0846		SF	N17E74	2710
22 May	0429	0507	0544	B2.8			
22 May	1447	1459	1519	B8.9			
22 May	2228	2242	2255	B2.4			
23 May	0249	0256	0309	B2.0			2712
23 May	0330	0335	0342	B1.8			2712
23 May	0358	0414	0423	B3.2			2712
23 May	0527	0534	0542	B2.0			2712
23 May	0600	0604	0612	B1.6			2712
23 May	0617	0621	0628	B2.3			2712
23 May	0751	0818	0824	B1.7			2712
23 May	0843	0848	0854	B1.8			2712
23 May	0855	0901	0908	B2.8			2712
23 May	0959	1003	1006	B4.4			2712
23 May	1108	1112	1115	B1.4			2712
23 May	1137	1150	1153	B2.5			2712
23 May	1301	1305	1309	B8.1			2712
23 May	1422	1426	1434	B1.7			2712
23 May	1638	1641	1643	B1.6			2711
23 May	1744	1748	1750	B2.8			2712
23 May	1753	1756	1758	B2.4			2712
23 May	1803	1821	1833	C2.0			2712
23 May	1939	1942	1944	B1.0			2712
23 May	2047	2056	2059	B1.1			2712
23 May	2105	2117	2121	B2.0			2712
23 May	2154	2159	2203	B2.3			2712
24 May	0258	0320	0339	B3.0			2712
24 May	0616	0623	0635	B4.5			2712
24 May	1116	1120	1138	B1.2			2712
24 May	1222	1230	1235	B9.8	SF	N16E33	2710
24 May	B1229	U1237	1247		SF	N16E34	2710

Flare List

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
24 May	1353	1401	1405		SF	N14E79	2712
24 May	1528	1532	1536	B1.4			2712
24 May	1608	1615	1622	B4.4			2712
24 May	1734	1737	1744	B1.2			2712
25 May	0331	0334	0337	B1.1			2712
25 May	1404	1442	1452	B1.2			2712
25 May	2001	2009	2016	B3.7	SF	N05W53	2711
25 May	2133	2134	2135		SF	N14E61	2712
25 May	2332	2335	2338	B1.9	SF	N14E59	2712
26 May	0111	0115	0122	B1.3			2712
26 May	0418	0422	0426	B1.1			2712
27 May	0100	0104	0107	B1.1			2712
27 May	0939	0944	0948	B1.1			2712
27 May	1744	1748	1751	B1.1			2712
27 May	1849	1852	1856	B1.1	SF	N14E34	2712

Region Summary

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
			Region 2710												
21 May	N16E64	223	20	2	Cro	2	B				1				
22 May	N17E52	221	20	5	Bxo	2	B								
23 May	N18E38	222	10	6	Bxo	2	B								
24 May	N17E25	222	0	1	Axx	1	A				2				
25 May	N17E11	223	plage												
26 May	N17W03	224	plage												
27 May	N17W17	224	plage												
								0	0	0	3	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 224

			Region 2711												
23 May	N06W28	288	40	5	Dao	8	B								
24 May	N06W41	288	60	6	Cai	6	B								
25 May	N06W55	289	40	7	Cso	5	B				1				
26 May	N07W70	291	30	4	Cro	3	B								
27 May	N05W84	291	10	3	Bxo	2	B								
								0	0	0	1	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 288

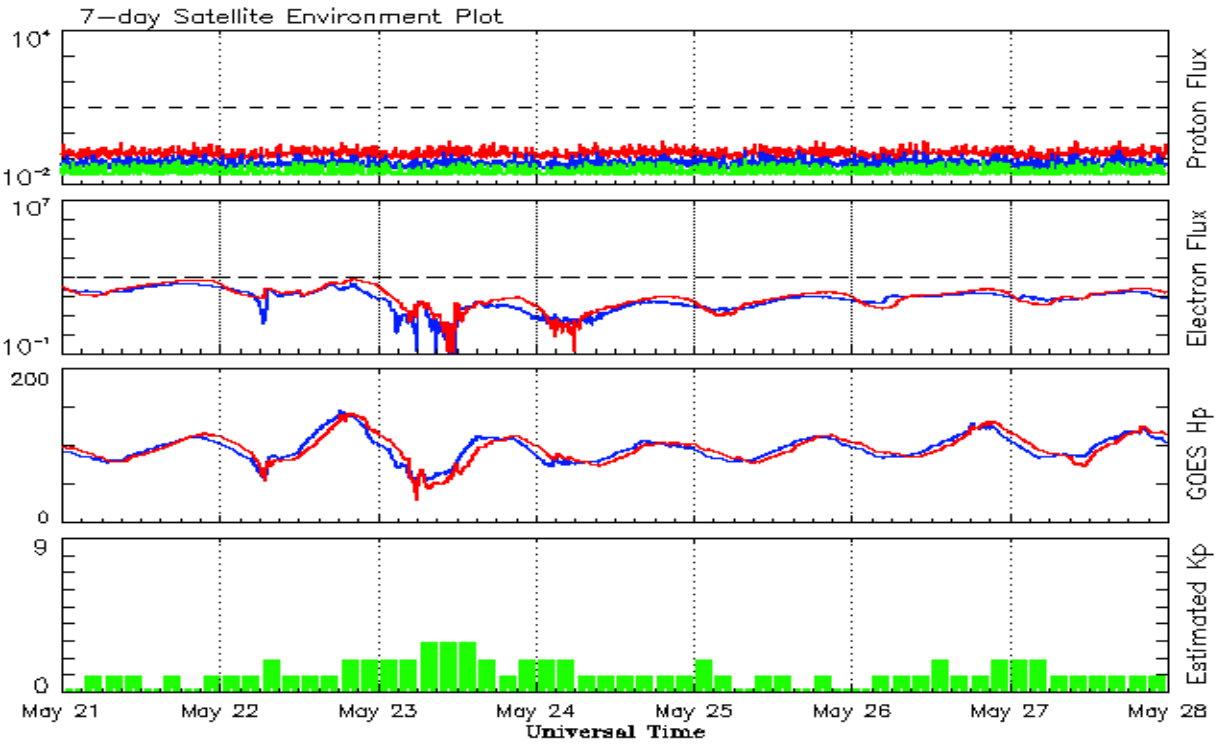
			Region 2712												
23 May	N13E89	172	plage					1							
24 May	N13E75	172	80	6	Cso	2	B				1				
25 May	N14E56	178	40	9	Cao	7	B				2				
26 May	N15E43	178	40	8	Cao	3	B								
27 May	N15E28	179	40	9	Cro	5	B				1				
								1	0	0	4	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 179

Recent Solar Indices (preliminary)
Observed monthly mean values

	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values		Ratio	Smooth values		Penticton	Smooth	Planetary	Smooth
Month	SEC	RI	RI/SEC	SEC	RI	10.7 cm	Value	Ap	Value
				2016					
May	48.9	30.9	0.64	42.1	26.9	93.1	93.2	12	11.7
June	19.3	12.3	0.65	39.0	24.9	81.9	90.4	9	11.4
July	36.8	19.4	0.53	36.5	23.1	85.9	87.7	10	11.2
August	50.4	30.1	0.60	34.2	21.6	85.0	85.5	10	11.2
September	37.4	26.8	0.72	32.1	19.9	87.8	83.7	16	11.3
October	30.0	20.0	0.67	31.1	18.9	86.1	82.5	16	11.6
November	22.4	12.8	0.57	29.4	17.9	78.7	81.1	10	11.6
December	17.6	11.1	0.64	28.1	17.1	75.1	80.0	10	11.4
				2017					
January	28.1	15.7	0.55	27.3	16.7	77.4	79.4	10	11.3
February	22.0	15.8	0.71	25.5	15.9	76.9	78.7	10	11.3
March	25.4	10.6	0.42	24.6	15.4	74.6	78.6	15	11.5
April	30.4	19.4	0.64	24.3	14.9	80.9	78.4	13	11.5
May	18.1	11.3	0.62	23.1	14.0	73.5	77.7	9	11.3
June	18.0	11.5	0.64	22.0	13.3	74.8	77.3	7	11.3
July	18.8	10.7	0.59	20.8	12.6	77.7	76.8	9	11.0
August	25.0	19.6	0.80	19.7	11.7	77.9	76.3	12	10.7
September	42.2	26.2	0.62	18.6	10.9	92.0	75.9	19	10.3
October	16.0	7.9	0.49	16.8	10.0	76.4	75.1	11	9.8
November	7.7	3.4	0.44			72.1		11	
December	7.6	4.9	0.64			71.5		8	
				2018					
January	7.8	4.0	0.51			70.0		6	
February	16.0	6.4	0.40			72.0		7	
March	6.0	1.5	0.25			68.4		8	
April	7.0	5.3	0.76			70.0		7	

Note: Values are final except for the most recent 6 months which are considered preliminary. Cycle 24 started in Dec 2008 with an RI=1.7.



Weekly Geosynchronous Satellite Environment Summary
Week Beginning 21 May 2018

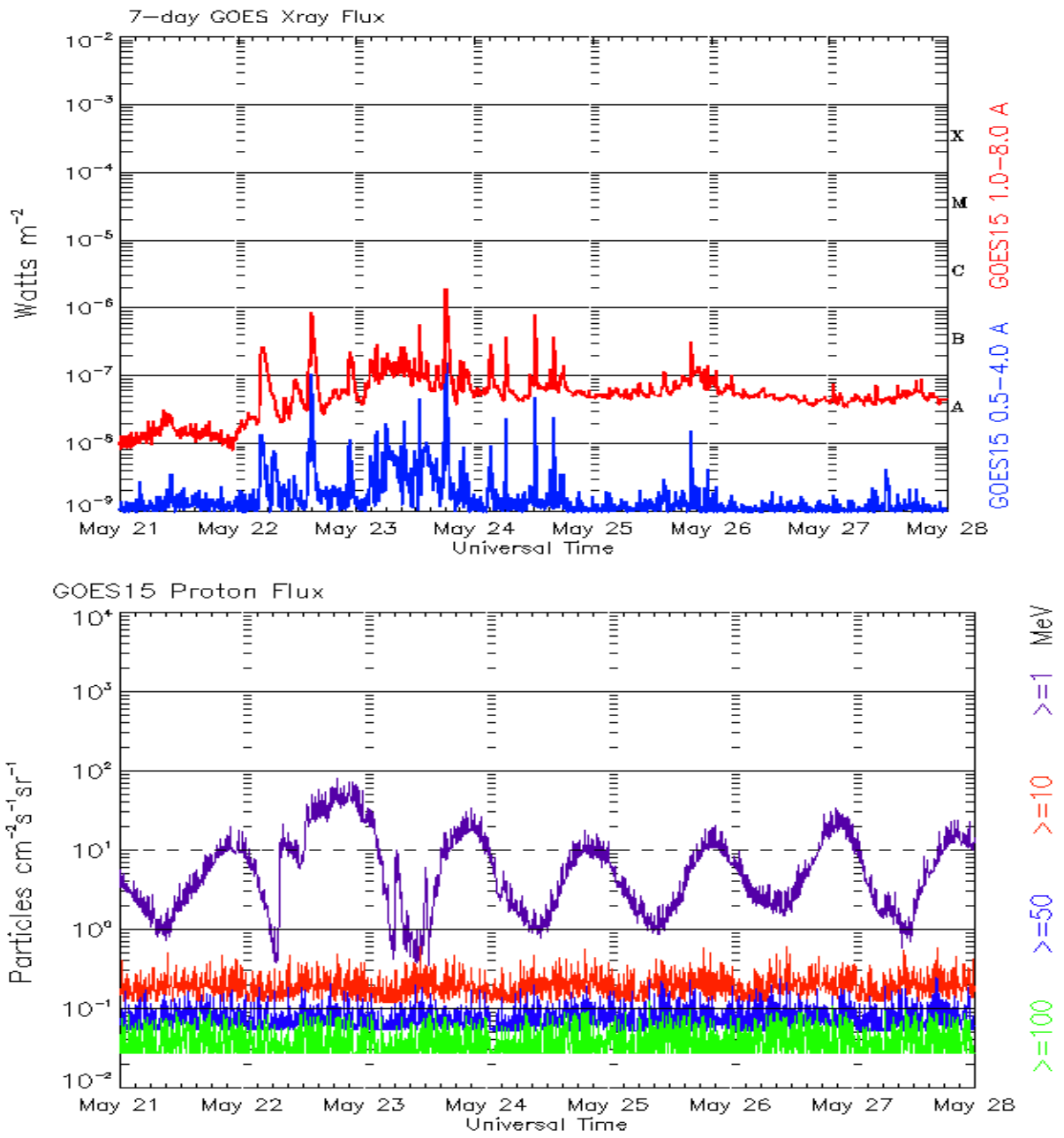
The proton flux plot contains the five-minute averaged integral proton flux (protons/cm^2-sec -sr) as measured by the SWPC Primary GOES satellite, near West 75, for each of three energy thresholds: greater than 10, 50, and 100 MeV.

The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm^2-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

The Hp plot contains the five minute averaged Hp magnetic field component in nanoteslas (nT) as by the SWPC Primary GOES satellite. The Hp component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

The Estimated 3-hour Planetary Kp-index is derived at the NOAA Space Weather Prediction Center using data from the following ground-based magnetometers: Boulder, Colorado; Chambon la Foret, France; Fredericksburg, Virginia; Fresno, California; Hartland, UK; Newport, Washington; Sitka, Alaska. These data are made available thanks to the cooperative efforts between SWPC and data providers around the world, which currently includes the U.S. Geological Survey, the British Geological Survey, and the Institut de Physique du Globe de Paris.

The data included here are those now available in real time at the SWPC and are incomplete in that they do not include the full set of parameters and energy ranges known to cause satellite operating anomalies. The proton and electron fluxes and Kp are 'global' parameters that are applicable to a first order approximation over large areas. H parallel is subject to more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.



Weekly GOES Satellite X-ray and Proton Plots
Week Beginning 21 May 2018

The x-ray plots contains five-minute averages x-ray flux (Watt/m^2) as measure by the SWPC primary GOES X-ray satellite, usually at West 105 longitude, in two wavelength bands, 0.05 - 0.4 and 0.1 - 0.8 nm. The letters A, B, C, M and X refer to x-ray event levels for the 0.1 - 0.8 nm band.

The proton plot contains the five-minute averaged intergral flux units (pfu = protons/cm^2 -sec -sr) as measured by the primary SWPC GOES Proton satellite for each of the energy thresholds: >1, >10, >30, and >100 MeV. The P10 event threshold is 10 pfu at greater than 10 MeV.

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Notice: The 27-day Outlook, Satellite Environment, X-ray and Proton plots have been redesigned. Comments and suggestions are welcome SWPC.Webmaster@noaa.gov

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